projectiondesign®
HIGH PERFORMANCE PROJECTORS

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F35
Communication Protocol

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Setting up LAN communication

The projector is shipped with a set of default settings, these are as follows:

Description	Value
DHCP	On
IP address	0.0.0.0
Subnet mask	0.0.0.0
Default gateway	0.0.0.0
TCP/UDP port	1025

Before you connect the projector to your LAN make sure that the IP settings are set correct according to your LAN configuration.

IP settings can be changed from OSD. It can be set automatically by using DHCP (Dynamic Host Configuration Protocol) or manually by disabling DHCP and set IP address, Subnet mask and Gateway.

When enabling DHCP please allow up to a minute for the projector to receive IP settings from the DHCP server. The IP address will be updated and shown in the OSD.

If there is no DHCP server in the network the projector will be assigned a “zero configuration” address, 169.254.0.0/16.

To renew an IP address, select “renew” in the OSD (setup->network).

Connecting to the projector

You have two options regarding how to make the physical connection to the projector. You can either use a crossover twisted pair (TP) cable directly from the computer to the projector, or two straight-through TP cables with a HUB or a switch between them.

When the projector is set up with proper IP settings, you should be able to control it.

Setting up RS232 communication

Connect to the projector

Connect the projector and host using a standard serial cable with 9-pin female to the host, and 9-pin male to the projector. Pin 2 connects to pin 2, pin 3 connects to pin 3 and pin 5 connects to pin 5.

RS232 Communication parameters

Table 1 shows supported rs232 settings:

Parameter	Data
Baud rate	19200
Parity	N
Databits	8
Stopbits	1
Flowcontrol	None

Table 1: RS232 parameters

Communication Protocol

This section describes how to use the communication protocol to control projectors remotely.
When the projects are connected to either RS232 or LAN you can control the projectors through this ASCII based protocol.
Note: Some commands will generate OSD feedback. This can be turned off from the projector's menu system or by setting "OSDC" to value 0 (OSD off) or value 1 (OSD show only warnings).

Timing

General timing constraints:

- Wait 30 seconds after power on before sending next command.
- Wait for response before sending next command.
- Minimum 2 seconds delay before resending if no response received.
- Minimum 500ms delay between commands.
- Minimum 5 seconds delay after sending 20 commands

Overview

The protocol has the following definition:

HEADER	SEPARATOR	ADDRESS	SEPARATOR	MESSAGE BODY	TERMINATOR
1 byte	1 byte	1 -3 bytes	1 byte	N bytes	1 byte

Field	Description	Comment
Header	ASCII character ':'	Required
Separator	ASCII character 'space'	Optional
Address	1 – 3 bytes address	Optional
Terminator	CR carriage return (0x0D)	Required

Message body

The message body structure is as follows:

MNEMONIC	SEPARATOR]	MODIFIER	SEPARATOR	VALUES
1 byte	1 byte	1 -3 bytes	1 byte	N bytes

Field	Description	Comment
Mnemonic	4 bytes key identifier, not case sensitive	Required
Modifer	Single char symbol	Optional
Values	N bytes value (max 6 bytes)	Optional
Target	N bytes value (max 4 bytes)	Optional
Separator	ASCII character 'space'	Optional

Mnemonic

The Mnemonic is 4 bytes key identifier, know as the ASCII command.
Example: POWR, SABS, IDVI

Modifiers

R	Relative change. Value given will be relative to the existing value. Example: :BRIG R10 will increase brightness with 10 steps
A	Request acknowledges. This modifier is only used to read back the result of the command. Default all commands send acknowledges so this will not be necessary.
	Default all commands send acknowledges so this will not be necessary.
?	Get current value
?M	Get maximum value
?N	Get minimum value
?D	Get default value
?S	Get default step value

Acknowledge/Response

Acknowledge is optional and ON by default. Auto acknowledge can be turned on and off with ECHO commad. It can also be activated on a per command basis using modifier A.

ACK	ADDRESS	SEP	COMMAND	SEP	VALUE	TERM
1 byte	3 bytes	1 byte	4 bytes	1 byte	6 bytes	1 byte

Field	Description	Comment
ACK	ASCII character '%'	Always
SEP	ASCII space	Always
VALUE	6 bytes return value	Always
TERM	Termination char 0x0D (CR)	Always

Most commands value returns the actual value of the requested command. If the requested command is not valid the response may include an error message.

Code	Error message	Description
!00001	Access denied	Current access level is too low
!00002	Not available	Command currently not available Example: Contrast is not available when the projector is searching for sources
!00003	Not implemented	Command to implemented
!00004	Value out of range	Value out of range

Some commands could return a value that is more than 6 characters, for instance strings.

Code	Extended info	Description
e00001	Extended info, string	A description string follows

Example:
> :seri ?
> %001 SERI e00001 07010001

Examples

The protocol accepts one single SPACE between fields, or no SPACE between fields.
'CR' ASCII value carriage return, hex value 0x0D.

SET-commands

SET POWER ON						
:	P	O	W	R	1	'CR'

:POWR1'CR'

ACKNOWLEDGE POWER ON																
%	0	0	1		P	O	W	R		0	0	0	0	0	1	'CR'

%001 POWR 000001'CR'

SET BRIGHTNESS TO 60								
:	B	R	I	G		6	0	'CR'

:BRIG 60'CR'

ACKNOWLEDGE BRIGHTNESS																
%	0	0	1		B	R	I	G		0	0	0	0	6	0	'CR'

%001 BRIG 000060'CR'

INCREMENT CONTRAST								
:	C	N	T	R		R	1	'CR'

:CNTR R1'CR'

ACKNOWLEDGE INCREMENT CONTRAST															
%	0	0	1		C	N	T	R		0	0	0	0	6	1	'CR'

%001 CNTR 000061'CR'

DECREMENT CONTRAST with 2 steps									
:	C	N	T	R		R	-	2	'CR'

:CNTR R-2'CR'

ACKNOWLEDGE INCREMENT CONTRAST															
%	0	0	1		C	N	T	R		0	0	0	0	5	9	'CR'

%001 CNTR 000059'CR'

SET-commands with target

SET ASPECT TRIGGER BEHAVIOR 16:10 to off								
:	T	A	T	B		1		3	'CR'

:TATB 1 3'CR'

ACKNOWLEDGE SET ASPECT TRIGGER BEHAVIOR 16:10															
%	0	0	1		T	A	T	B		0	0	0	0	0	1	'CR'

%001 TATB 000001'CR'

GET-commands

GET current value CONTRAST						
:	C	N	T	R	?	'CR'

CNTR?'CR'

ACKNOWLEDGE CONTRAST GET															
%	0	0	1		C	N	T	R		0	0	0	0	5	9	'CR'

%001 CNTR 000059'CR'

GET minimun value BRIGHTNESS								
:	B	R	I	G		?	N	'CR'

:BRIG ?N'CR'

ACKNOWLEDGE BRIGHTNESS GET MIN															
%	0	0	1		B	R	I	G		0	0	0	0	0	0	'CR'

%001 CNTR 000000'CR'

GET-commands with target

GGET ASPECT TRIGGER BEHAVIOR 16:10									
:	T	A	T	B		?		3	'CR'

: TATB ? 3

ACKNOWLEDGE GET ASPECT TRIGGER BEHAVIOR 16:10 off															
%	0	0	1		T	A	T	B		0	0	0	0	0	1	'CR'

%001 TATB 000001 'CR'

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ASCII protocol

Showing all properties for available commands.

Command	Description	Platforms*	Operations supported	Comments
POWR	Power	GP3	Get, Set	0 - power off, 1 - power on
POST	Power state	GP3	Get	See value table POST
Soure selection				
IABS	Set source abs values	GP3	Get, Set	See value table IABS
IDVI	Select DVI	GP3	Get, Set	1 - DVI 1, 2 - DVI 2
IHDM	Select HDMI	GP3	Get, Set	1 - HDMI 1, 2 - HDMI 2
ISTS	Signal Status	GP3	Get	0 - searching 1 - locked to source
Picture				
BRIG	Brightness	GP3	Get, Set	
CNTR	Contrast	GP3	Get, Set	
PRST	Picture Reset	GP3	Get, Set	
PMUT	Picture Mute	GP3	Get, Set	0 - disable, 1 - enable
SABS	Set Scaling abs value	GP3	Get, Set	See value table SABS
S1T1	Select Scaling 1:1	GP3	Get, Set	
S169	Select Scaling 16:9	GP3	Get, Set	
SS43	Select Scaling 4:3	GP3	Get, Set	
SFLA	Select Scaling FillAll	GP3	Get, Set	
SFAR	Select Scaling FillAspectRatio	GP3	Get, Set	
GAFI	Select Gamma Film	GP3	Get, Set	1 - Film 1, 2 - Film 2
GAVI	Select Gamma Video	GP3	Get, Set	1 - Video 1, 2 - Video2
GACO	Select Gamma Computer	GP3	Get, Set	1 - Computer 1, 2 - Computer 2
GABS	Set Gamma abs value	GP3	Get, Set	See value table GABS
Picture->RealColor				
BCCR	BrilliantColor Control	GP3	Get, Set	See value table BCCR
CMOD	Color Management Enable	GP3	Get, Set	0 - disable, 1- enable
CMXV	Color Management X-Coordinate	GP3	Get, Set	
CMYV	Color Management Y-Coordinate	GP3	Get, Set	
CMTV	Color Management Temperature	GP3	Get, Set	3200 - 9300
RD65	Reset to D65	GP3	Set	
DSCR	Desired Coords Mode	GP3	Get, Set	See value table DSCR
DSRX	Desired Red X	GP3	Get, Set	
DSRY	Desired Red Y	GP3	Get, Set	
DSRG	Desired Red Gain	GP3	Get, Set	
DSGX	Desired Green X	GP3	Get, Set	
DSGY	Desired Green Y	GP3	Get, Set	
DSGG	Desired Green Gain	GP3	Get, Set	
DSBX	Desired Blue X	GP3	Get, Set	
DSBY	Desired Blue Y	GP3	Get, Set	
DSBG	Desired Blue Gain	GP3	Get, Set	
DSCX	Desired Cyan X	GP3	Get, Set	
DSCY	Desired Cyan Y	GP3	Get, Set	
DSCG	Desired Cyan Gain	GP3	Get, Set	
DSMX	Desired Magenta X	GP3	Get, Set	
DSMY	Desired Magenta Y	GP3	Get, Set	

*Supported commands for the various product platforms are marked GP1, GP2, and GP3. Typical Products are GP3: F35

Command	Description	Platforms*	Operations supported	Comments
DSMG	Desired Magenta Gain	GP3	Get, Set	
DSYX	Desired Yellow X	GP3	Get, Set	
DSYY	Desired Yellow Y	GP3	Get, Set	
DSYG	Desired Yellow Gain	GP3	Get, Set	
DSWG	Desired White Gain	GP3	Get, Set	
MSRX	Measured Red X	GP3	Get, Set	3200 - 9300
MSRY	Measured Red Y	GP3	Get, Set	
MSRL	Measured Red Luminance	GP3	Get, Set	
MSGX	Measured Green X	GP3	Get, Set	
MSGY	Measured Green Y	GP3	Get, Set	
MSGL	Measured Green Luminance	GP3	Get, Set	
MSBX	Measured Blue X	GP3	Get, Set	
MSBY	Measured Blue Y	GP3	Get, Set	See value table DSCR
MSBL	Measured Blue Luminance	GP3	Get, Set	0 - disable, 1 - enable
MSWX	Measured White X	GP3	Get, Set	
MSWY	Measured White Y	GP3	Get, Set	
MSWL	Measured White Luminance	GP3	Get, Set	
MSDX	Measured BC1 X	GP3	Get, Set	
MSDY	Measured BC1 Y	GP3	Get, Set	
MSDL	Measured BC1 Luminance	GP3	Get, Set	
MSEX	Measured BC2 X	GP3	Get, Set	
MSEY	Measured BC2 Y	GP3	Get, Set	
MSEL	Measured BC2 Luminance	GP3	Get, Set	
CMTP	Color Management Test Patterns	GP3	Get, Set	

Picture->Advanced				
DLSP	Digital Level and Colorspace	GP3	Get, Set	0 - manual, 1 - auto
DVST	Digital Level	GP3	Get, Set	0 - computer, 1 - video
DCSP	Digital Color Space	GP3	Get, Set	See value table DCSP

Installation				
DESK	Select Orientation Desktop Front	GP3	Get, Set	
CEIL	Select Orientation Ceiling Front	GP3	Get, Set	
RDES	Select Orientation Desktop Rear	GP3	Get, Set	
RCEI	Select Orientation Ceiling Rear	GP3	Get, Set	
ORIE	Select Orientation abs value	GP3	Get, Set	See value table ORIE
SCAN	Source Scan	GP3	Get, Set	0 - disable, 1 - enable
IR01	IR Enable 1	GP3	Get, Set	0 - disable, 1 - enable
IR02	IR Enable 2	GP3	Get, Set	0 - disable, 1 - enable
IR03	IR Enable 3	GP3	Get, Set	0 - disable, 1 - enable
OSDC	OSD Enable	GP3	Get, Set	See value table OSDC
TEST	Test Image	GP3	Get, Set	0 - 7 different test patterns
DHED	Dual Head Setup Mode	GP3	Get, Set	0 - off, 1 - side by side

Installation->lamp				
ECOM	Eco Mode	GP3	Get, Set	0 - disable, 1 - enable
LPW1	Lamp1 Power	GP3	Get, Set	
LPW2	Lamp2 Power	GP3	Get, Set	
LMOD	Lamp Mode	GP3	Get, Set	See value table LMOD
LDLY	Lamp Auto Switch Delay	GP3	Get, Set	

Command	Description	Platforms*	Operations supported	Comments
Installation->trigger				
TRG1	Trigger 1 Mode	GP3	Get, Set	See value table TRGx
TRG2	Trigger 2 Mode	GP3	Get, Set	See value table TRGx
TATB	Aspect Trigger Behavior	GP3	Get, Set	See value table TATB
Settings				
FCRE	Factory Reset	GP3	Set	
FCRL	Factory reset level	GP3	Get, Set	0 - limited, 1 - full
PINC	PIN Code	GP3	Set	
CODE	Service Code	GP3	Set	
RCID	RCID Internal	GP3	Get, Set	
DPMS	DPMS	GP3	Get, Set	0 - disable, 1 - enable
DPMT	DPMS Timeout	GP3	Get, Set	
KEYB	Backlight Timeout	GP3	Get, Set	
MNUT	Menu Timeout	GP3	Get, Set	
BACK	Background color	GP3	Get, Set	
SPLH	Splash	GP3	Get, Set	
LMUT	LED indicators mute	GP3	Get, Set	0 - off, 1 - on
Settings->Set date and time				
RTCH	Real Time Clock Hour	GP3	Get, Set	
RTCM	Real Time Clock Minute	GP3	Get, Set	
RTCS	Real Time Clock Second	GP3	Get, Set	
RTCD	Real Time Clock Day	GP3	Get, Set	
RTCN	Real Time Clock Month	GP3	Get, Set	
RTCY	Real Time Clock Year	GP3	Get, Set	
RTCW	Real Time Clock Day of Week	GP3	Get	
Lens control				
FOIN	Focus In	GP3	Set	1 - Slow, 2 - Medium, 3 - Fast
FOUT	Focus Out	GP3	Set	1 - Slow, 2 - Medium, 3 - Fast
ZOIN	Zoom In	GP3	Set	1 - Slow, 2 - Medium, 3 - Fast
ZOUT	Zoom Out	GP3	Set	1 - Slow, 2 - Medium, 3 - Fast
IROP	Iris Open	GP3	Set	1 - Slow, 2 - Medium, 3 - Fast
IRCL	Iris Close	GP3	Set	1 - Slow, 2 - Medium, 3 - Fast
LSDW	Lens Shift Down	GP3	Set	1 - Slow, 2 - Medium, 3 - Fast
LSUP	Lens Shift Up	GP3	Set	1 - Slow, 2 - Medium, 3 - Fast
LSLF	Lens Shift Left	GP3	Set	1 - Slow, 2 - Medium, 3 - Fast
LSRH	Lens Shift Right	GP3	Set	1 - Slow, 2 - Medium, 3 - Fast
SHUT	Shutter	GP3	Set	0 - disable, 1 - enable
LENS	Lens ID	GP3	Get	
LMON	Lens Monitoring	GP3	Get, Set	
Lamp status				
LRM1	Lamp1 Estimated Remaining Lamp Time	GP3	Get	
LTR1	Lamp1 Runtime	GP3	Get	
LHO1	Lamp Channel 1 Total Time	GP3	Get	
LST1	Lamp1 Status	GP3	Get	See value table LST1 and LST2
LRM2	Lamp2 Estimated Remaining Lamp Time	GP3	Get	

Command	Description	Platforms*	Operations supported	Comments
LTR2	Lamp2 Runtime	GP3	Get	
LHO2	Lamp Channel 2 Total Time	GP3	Get	
LST2	Lamp2 Status	GP3	Get	See value table LST1 and LST2
UTOT	Unit Time Total	GP3	Get	

Menu navigate				
MENU	Menu Navigate Toggle OSD Menu	GP3	Set	
NVUP	Menu Navigate Up	GP3	Set	
NVDW	Menu Navigate Down	GP3	Set	
NVLF	Menu Navigate Left	GP3	Set	
NVRH	Menu Navigate Right	GP3	Set	
NVOK	Menu Navigate Ok	GP3	Set	

Miscellaneous				
ECHO	Communication Response (on/off)	GP3	Set	
LANG	Language	GP3	Get, Set	
SINF	Show OSD Info	GP3	Set	

Service				
CWI1	Color Wheel Index 1	GP3	Get, Set	
CWI2	Color Wheel Index 2	GP3	Get, Set	
CRST	Reset All Counters	GP3	Set	
MAYR	Manufacture Year	GP3	Get	
MAWE	Manufacture Week	GP3	Get	
LFMP	LFM Performed	GP3	Set	
GPEN	Enable Power User Gammas	GP3	Get, Set	

Thermal				
THRM	Thermal Status	GP3	Get	
FAN1	Fan Speed 1	GP3	Get	
FAN2	Fan Speed 2	GP3	Get	
FAN3	Fan Speed 3	GP3	Get	
FAN4	Fan Speed 4	GP3	Get	
FAN5	Fan Speed 5	GP3	Get	
FAN6	Fan Speed 6	GP3	Get	
FAN7	Fan Speed 7	GP3	Get	
FAN8	Fan Speed 8	GP3	Get	
SNS1	Sensor Value 1	GP3	Get	
SNS2	Sensor Value 2	GP3	Get	
SNS3	Sensor Value 3	GP3	Get	
SNS4	Sensor Value 4	GP3	Get	
SNS5	Sensor Value 5	GP3	Get	
SNS6	Sensor Value 6	GP3	Get	
SNS7	Sensor Value 7	GP3	Get	
SNS8	Sensor Value 8	GP3	Get	

Command	Description	Platforms*	Operations supported	Comments
Status				
PLAT	Platform Name String	GP3	Get	
SERI	Serial Number String	GP3	Get	
MODL	Model Name String	GP3	Get	
PART	Part Number String	GP3	Get	
SVER	Software Version	GP3	Get	
ACSS	Current Access Level	GP3	Get	
MACA	MAC address	GP3	Get	
IPAD	IP address	GP3	Get	
LEST	Indicator LED state	GP3	Get	See value table LEST

Value tables

IABS Set source abs values Value	Description
2	DVI 1
8	HDMI 1
10	DVI 2
11	HDMI 2

SABS Set scaling abs values Value	Description
0	1:1
1	Fill All
2	Fill Aspect Ratio
3	Fill 16:9
4	Fill 4:3

LST1 and LST2 Lamp status Value	Description
0	Defect
1	Warming up
2	Lamp is on
3	Lamp is off
4	Lamp is cooling down
5	Lamp is not present

GABS Set Gamma abs value Value	Description
0	Film 2.2
1	Film 2.8
2	Video 1
3	Video 2
7	Computer 1
8	Computer 2

DSCR Desired Coords Mode Value	Description
0	Off
1	RGB
2	RGBCMY

ORIE Select Orientation abs value Value	Description
0	Desktop front
1	Ceiling rear
2	Desktop rear
3	Ceiling front

OSDC OSD Enable Value	Description
0	OSD off
1	OSD show only warnings
2	OSD on

LMOD Lamp Mode Value	Description
0	Single lamp 1
1	Single lamp 2
2	Dual lamps
3	Auto lamp switch

BCCR BrilliantColor Control Value	Description
0	Off
1	Computer balanced
2	Video balanced
3	Computer native
4	Video native

POST Power state Value	Description
0	Deep sleep
1	Off
2	Powering up
3	On
4	Powering down
5	Critical powering down
6	Critical off

LEST Status LED state Value	Description
0	Green/Blue On
1	Green/Blue Flash
2	Yellow On
3	Yellow Flash
4	Red On
5	Red Flash

DCSP Digital colorspace Value	Description
0	RGB
1	YPbPr 709
2	YpbPr 601

TRGx Trigger mode Value	Description
1	On
2	Off
3	Screen
4	Aspect

TATB Aspect trigger behavior Target	Value	Description
0 - 4:3		
1 - 5:4	0	on
2 - 16:9	1	off
3 - 16:10	2	no change
4 - no source		
5 - standby		

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